HANDBOOK OF PHONOLOGICAL DATA
FROM A SAMPLE OF THE WORLD'S LANGUAGES

A Report of the Stanford Phonology Archive

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210 Spanish	210 Spanish	210 Spanish
210 01 p[01] [p-unreleased][60]	[g][04 62] [gamma-half-voice][67] (free)	
210 02 t[01] [t-interdental][61]	12 m[32] [m-labiodental][68] (neutral,allo)	51 i[21] [iota][22 70]
210 03 k[01 02] [k-unreleased][60]	13 n[12 32] [n-interdental][68] (neutral,allo) [n-dental][68] (neutral,allo) [eng][14 68] (neutral,allo)	52 e-mid[21] [epsilon][71]
210 04 t/s-hacek[03]		53 a[23] [alpha-unrounded][24 72] (allo,free)
210 05 f	14 n-palatal[13]	54 u[25] [upsilon][26 70]
210 06 beta [b][04 62] [b-unreleased][63] [beta-half-voice][05 63] (free)	16 l[15 33] [l-interdental][69] [l-dental][69] [l-palatoalveolar][34 69]	55 o-mid[21] [o-open][73] [o][73]
210 07 theta[06 30] [eth][64]	17 l-palatal[16 35]	56 yod[39] [j-fricative][74] [d/j-fricative][27 40 74] (free) [c-fricative][40 74]
210 08 eth-lax[07] [d][04 62] [eth-half-voice-lax][08 65]	18 r-flap[17 18 36] [r-fricative-voiceless][37 76] (free)	57 w[39] [gamma-labialized][75] [beta-velarized][75] (free)
210 09 s[09 31] [z][66]	19 r-trill[17 19 36] [r-fricative][20 38] (free)	
210 10 x[10]		
210 11 gamma[11]		

210 $a Spanish $b Castilian $d Romance $e Spain, Mexico, Central and South America, etc. $f 150 million $g John Crothers $g Marilyn Vihman (review)

210 $a Navarro, Tomas T. $b 1961 [10th edition] $c Manual de Pronunciacion Espanola $f (Publicaciones de la Revista de Filogia Espanola Num. 3) $g Madrid $q author is native speaker and chief authority on Spanish pronunciation

210 $a Harris, James W. $b 1969 $c Spanish Phonology $f (MIT Research Monograph No. 54) $g Cambridge, Mass.: MIT Press

210 $a Saporta S., and H. Contreras $b 1962 $c A Phonological Grammar of Spanish $g Seattle: University of Washington Press

210 $a **INTONATION** $A Navarro defines a phonological phrase ("grupo fonico") as an utterance bounded by silence on both ends. (p.30) There are two basic intonation patterns for phonological phrases. (p.209ff) Both begin on a relatively low pitch, and rise gradually over an interval of a fourth or fifth to the normal pitch of the utterance, which begins on the first accented syllable. The pitch is maintained at this level until it either rises or falls, beginning on one of the last three syllables of the phrase. In declarative sentences the pitch falls at the end. If there are several phrases within a declarative sentence, all but the last rise at the end, and the last one falls. However, a parenthetical phrase has falling pitch at the end, and non-restrictive qualifying phrases are simply followed by a brief pause without any pitch change at the end. (p.218-9) When several phrases are strung together in a list, each has falling pitch at the end, except for the next to the last. This one has rising pitch if there is a conjunction between it and the last phrase, and otherwise has falling pitch. Questions have a somewhat different pattern. The phrase begins with a pitch rise, and then pitch gradually falls till the last syllable of the phrase, where it rises, or rises and then falls, depending on the sense of the question. (p.226) (These would appear to be yes-no questions.) Questions beginning with interrogative words have a similar pattern, except that at the end pitch may fall further, rise, or rise and fall, depending on the speaker's intentions. (p.229) Questions which consist of a disjunction between two phrases have the same basic pattern as declarative sentences. (p.228)

210 $a **LONG CONSONANTS (NON-DISTINCTIVE)** $a **LONG VOWELS (NON-DISTINCTIVE)** $A Generally speaking the vowels can be said to be short, in comparison, say, to the long vowels of German. However there

are differences in vowel length determined by accent and position. Accented vowels are longest (17.2 centiseconds average) in the last syllable of a word, when not followed by /n/ or /l/. An intermediate length (12.9 centiseconds average) occurs on accented vowels in the last syllable of a word when followed by /n/ or /l/, and on accented vowels in penultimate open syllables. The shortest accented vowels (8.6 centiseconds average) occur in closed penultimate syllables and in antepenultimate syllables. The following consonant also has some influence on vowel length; the shorter the consonant the longer the vowel. Unaccented vowels are shortest in post-tonic syllables and longest in final syllables. The average figures are: initial syllable - 6.4 centiseconds; pretonic syllable - 5.8 centiseconds; post-tonic syllable - 5.0 centiseconds; final syllable - 11.4 centiseconds. Consonantal length varies according to the type of consonant and its environment. Consonants are longest in intervocalic position following an accented vowel. The longest consonants are the voiceless obstruents /p, t, k, f, theta, s, x, t/s-hacek/, the affricate [d/j-fricative], and /r-trill/ with an average duration in post-tonic position of 12.6 centiseconds. The shortest consonants are the voiced fricatives /beta, eth-lax, gamma/, and /r-flap/ and /yod/, with an average duration in post-tonic position of 5.5 centiseconds. The nasals and laterals fall inbetween. There is no connection between the "heavy" and "light" syllables of Latin and duration in modern Spanish. (p.197ff)

210 $a **PHONOLOGICAL WORD** $A Only one consonant is possible word finally. (Saporta and Contreras)

210 $a **STRESS** $A According to Navarro (p.181ff) an accented syllable is one with relatively greater intensity, i.e. force of expiration, than its neighbors. However he adds later (p.215) that an accented syllable generally coincides with an intonation peak. In most cases the accent of a modern Spanish word derives directly from the Latin accent, i.e. it falls on the same syllable that was accented in Latin, in spite of modifications in neighboring syllables. Every Spanish word (by this is meant inflected word, not stem or lexical item) has a fixed accent. Displacement of the accent may render a word incomprehensible. The accent must fall on one of the last three syllables of a word. There are a few compound forms that have the accent farther back. Also compound words may have two accents. Minimal pairs and triplets can be found contrasting the different accent positions (p.183) on different inflected or derived forms of some stems. Accent thus serves a limited morphological function. Harris (p.118ff) notes that stress is not entirely independent of segmental environment, in that words with strong penultimate syllables cannot take the accent on the antepenult. Noun stems have a fixed accent. Noun stems ending in a consonant, which have an extra syllable in the plural, also obey this rule. There are a couple of exceptional nouns which move the accent in the plural. (Navarro, p.185) Navarro does not discuss rules for the accentuation of verb forms. From the data presented in Harris the following general picture can be drawn. In verbal forms the position of the accent is determined by the inflectional category, each ending being associated with a fixed accent position. In general each tense-mood category (present indicative, present subjunctive, perfect, etc.) has the accent in a fixed position relative to the verb stem, whatever the inflection for person and number may be. For the present indicative and subjunctive this position is the last syllable of the verb stem; for the future it is the second syllable after the verb stem; for the perfect and imperfect it is the first syllable after the verb stem, and so on. The chief exceptions to this rule are the first person plural present indicative and subjunctive forms (stem plus /-V.m.o.s/), which take penult accent, which falls after the verb stem, rather than on its last syllable.

210 $a **SYLLABLE** $A (C)(C)(G)V(G)(C)(C) $A The possibility of two syllable final consonants is noted in Navarro's rules for syllable division. (p.173) Also see Saporta and Contreras.

210 01 $A The stops are produced with "moderate tension" (Navarro, p.83); according to Harris (p.41f) they are impressionistically similar to Korean voiceless unaspirated stop with heightened subglottal pressure.

210 02 $A The position of /k/ varies from post-palatal to velar depending on following vowel. /k/ is "slightly weaker than /p/ and /t/." (p.137)

210 03 $A In producing /t/s-hacek/ tension is somewhat less than for the stops. The tip of the tongue is free and may touch the lower teeth. (Navarro, p.126)

210 04 $A In producing the voiced stops, voicing precedes release by 60-70 msec. (Navarro, p.79) Harris estimates "on the order of" 100 msec. (Harris, p.41) Muscular tension is somewhat less than for voiceless stops. [b] is weaker than the unaspirated initial stops of English and German. (Navarro, p.84)

210 05 $A In the relevant position, voicing may stop during the articulation of /beta/, in casual speech. (p.86f)

210 06 $A /theta/ is "more interdental" and more energetic than English /theta/. (Navarro, p.93)

210 07 $A /eth-lax/ is "dento-interdental." (Navarro, p.99) The tongue tip touches the edge of the upper teeth gently, with a light rapid movement. Different circumstances cause the articulation to vary from dento-interdental and clearly fricative to dental and more or less occlusive, the former predominating in ordinary conversation. It is less interdental, more relaxed, and weaker than voiced /theta/. /eth-lax/ has "weak muscular tension." (Navarro, p.99)

210 08 $A [eth-half-voice-lax] is very weak in final position.

210 09 $A In producing /s/, the tongue tip touches the teeth before dentals and interdentals. There i blade articulation in many dialects. (p.107) Tension varies greatly. /s/ is very weak before [f, theta]. (p.106)

210 10 $A The place of articulation of /x/ varies from uvular to post-palatal depending on the following vowel. (p.142) /x/ has greater friction than other Spanish consonants, but is weak in final position. (p.142)

210 11 $A The friction of /gamma/ may be very weak in rapid speech. (p.139)

210 12 $A Final /n/ before pause is partly devoiced. (Navarro, p.112)

210 13 $A In producing /n-palatal/, the tip of the tongue is placed against the lower teeth. (p.132)

210 14 $A In the articulation of [eng], velar contact need not be a complete closure before /x/ and /w/. [eng] frequently disappears entirely before /w/, with vowel nasalization. (p.141f)

210 15 $A /l/ is not velarized. (p.114)

210 16 $A /l-palatal/ involves extensive contact between tongue and palate. (p.134)

210 17 $A /r-flap/ has much less muscular tension than /r-trill/. (Harris, p.47)

210 18 $A When /r-flap/ is a member of a consonant cluster, there is a brief vowel between flap and consonant. (Navarro, p.116)

210 19 $A In producing /r-trill/, the tongue tip touches the highest part of the alveolae. Normally there are three taps in initial position, two taps after /n, l, s/ and four taps intervocalically after stressed vowel. Emphasis increases the number of taps. (p.121f)

210 20 $A In producing [r-fricative], the tongue seems to be slightly retracted or retroflected. (Harris, p.47)

210 21 $A /i/ and /e-mid/ are not as high or as tense as the corresponding French or German vowels. (p.47) The Spanish "close" mid vowels are nearer to "open" than in other languages. (p.50)

210 22 $A The difference between open and close allophones of all vowels is relatively minor, especially with the high vowels /i/ and /u/. (p.72, 73) Not as open as English "think" or German "nicht." [iota] is less advanced than [i]. (p.47)

210 23 $A A slightly fronted variety of /a/ appears before palatal consonants and in the diphthong /a.i/, but Navarro does not consider it sufficiently different to be considered a distinct "sound." (p.55)

210 24 $A [alpha-unrounded] is distinctly velar, but shorter and less velar than the sound in English "father." (p.56)

210 25 $A In producing /u/, the back of the tongue is raised toward the velum. The tongue tip is at the level of the alveolae, but behind them, or barely touching. The lips form a relatively narrow oval opening. (p.60f)

210 26 $A [upsilon] is similar to German "Gurt," "Mund;" not as open as English "put." The difference between [u] and [upsilon] is relatively small. (p.61) [upsilon] has relatively weak tension.

210 27 $A Navarro's lengthy description of [d/j-fricative] indicates than the blade of the tongue is the articulator, with the apex against the lower teeth. There is greater contact of tongue and palate than in /t/s-hacek/. (p.127, 128)

210 30 $A /theta/ is replaced by /s/ in America, Andalucia, Cantanarias, and various local dialects. (Navarro, p.93)

210 31 $A /s/ is replaced by /theta/ in parts of Andalucia. (p.109) Final /s/ before consonant or pause becomes /h/ in some dialects. (p.106)

210 32 $A The pre-consonantal nasal allophones are all in complementary distribution. They have been divided into allophones of /m/ and /n/ in the Archive and labeled "neutral."

210 33 $A In syllable-final position /l/ may be confused with [r-fricative].

210 34 $A Harris (p.18f) distinguishes between [l-palatoalveolar], which occurs before /t/s-hacek/, and /l-palatal/. According to Navarro (p.114) it is /l-palatal/ which occurs before /t/s-hacek/.

210 35 $A /l-palatal/ becomes /yod/ in many American and a number of Spanish dialects.

210 36 $A /r-flap/ contrasts with /r-trill/ only intervocalically. It does not occur initially or after /l, n, s/, where /r-trill/ does occur.

210 37 $A Harris says occurrence of [r-fricative-voiceless] is erratic. (p.48) Navarro reports this segment only for the dialect of Asturias. (p.119)

210 38 $A Harris says occurrence of [r-fricative] is limited to "non-energetic" speech. (p.47) Navarro says the fricative is more common in familiar speech, and the trill in cultivated speech. (p.118)

210 39 $A /yod/ and /w/ do not occur in syllable initial position, but only as second element of a diphthong or of a syllable-initial consonant cluster. Navarro treats these two environments as requiring slightly different sounds, the second (after a consonant) being more close, thus more like a consonant. (p.48, 49) In relaxed pronunciation syllable initial /yod/, usually [j-fricative], may also sometimes be pronounced more like a vowel (Navarro, p.130), presumably like [yod]. Harris (p.26ff) has a rule converting [j-fricative] (orthographic "y") from those with initial unstressed /i/ (orthographic "hi"), although these are said to fall together at conversational tempo. (p.27) Navarro insists that these words should always be pronounced with the same initial sound, and that their differentiation is purely a spelling pronunciation. (p.48f) Navarro considers the [w] of a diphthong to be a "semivowel," that of a consonant cluster a "semiconsonant," in parallel with his treatment of [yod]. (p.62-64) Harris treats the occurrence of [w] for [gamma-labialized] as exactly parallel to the use of [yod] for [j-fricative] in normal conversation. (p.26ff) But Navarro seems to say that the fricative character of [gamma-labialized] becomes greater, rather than less, in conversation. (p.64)

210 40 $A Navarro assigns [d/j-fricative] to emphatic or affected speech. The evidence for the existence of [c-fricative], discussed by Harris (p.22ff), is apparently to be found in King (1952), "Outline of Mexican Spanish Phonology," Studies in Linguistics, 10, p.51-52. Navarro allows only for [yod] in the position in question.

210 60 $A /p/ and /k/ are unreleased before /t/.

210 61 $A /t/ becomes interdental after /theta/.

210 62 $A The voiced fricatives are realized as stops initially after pause and following nasals and /l/.

210 63 $A /beta/ is realized as [beta-half-voice] before voiceless obstruents in casual speech, and as [b-unreleased] before /m/. /beta/ may become [m] in this position. (p.84) There appears to be a considerable range of possible pronunciations, including stop or fricative, and different degrees of voicing. (p.86)

210 64 $A In ordinary conversation /theta/ is voiced before a voiced consonant. (Navarro, p.95)

210 65 $A /eth-lax/ is partly devoiced before voiceless fricatives and more fully devoiced finally. (p.100, 103)

210 66 $A /s/ is normally voiced before voiced consonants.

210 67 $A /gamma/ may be partly devoiced before voiceless obstruents and before pause. (Harris, p.40) Navarro says that /gamma/ may be partly devoiced before [theta]. (p.140)

210 68 $A In consonant clusters nasals assimilate to the place of the following consonant. (In rapid speech [m-labiodental] may disappear with nasalization of the preceding vowel. Or, following a word-initial vowel, the vowel may be lost, apparently leaving a syllabic nasal. (p.90))

210 69 $A /l/ assimilates to the place of articulation of a following dental, interdental, or palatal.

210 70 $A /i/ and /u/ are lowered to lower-high in closed syllable, or before /x/, or in contact with /r-trill/.

210 71 $A /e-mid/ is realized as [epsilon] before /x/ or /yod/, in contact with /r-trill/, and in closed syllables not ending in /m/, /n/, /s/, /theta/, /eth/.

210 72 $A /a/ is realized as [alpha-unrounded] in the diphthong /a.u/, before /o-mid/, before /l/ in the same syllable, and before /x/. Irregularly before /gamma/. (In general every /a/ pronounced slowly and without strong accent tends towards a velar articulation. Emphatic pronunciation makes much use of [alpha-unrounded]. Its abuse is generally interpreted as rusticity or affectation. (p.56f))

210 73 $A /o-mid/ is raised before /u/ in the next word (p.58), and is lowered in closed syllables, adjacent to /r-trill/, before /x/ or /yod/, and accented, when following /a/ in the preceding syllable and before a liquid.

210 74 $A /yod/ is realized as [j-fricative] or [d/j-fricative] in syllable-initial position, and as [c-fricative] before pause.

210 [75] $A /w/ is realized as [gamma-labialized] or [beta-velarized] in syllable initial position.

210 [76] $A /r-flap/ may be realized as [r-fricative-voiceless] before pause.